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2025-07-28-18-29-33-01: 好的，这是对图片中英文段落的逐句中英对照翻译：

2025-07-28-18-29-33-02: English:

2025-07-28-18-29-33-03: A memristive Chua's circuit regarded as a paradigm is reconsidered to exhibit its extreme multistability in this Letter.

2025-07-28-18-29-33-04: 汉语 (Chinese):

2025-07-28-18-29-33-05: 本快报将忆阻蔡氏电路作为一个范例，重新审视了其极端多稳性。

2025-07-28-18-29-33-06: English:

2025-07-28-18-29-33-07: Memristor initial state-dependent dynamics is analysed and the coexistence of infinitely many attractors related to memristor initial states is revealed by numerical simulations and circuit simulations.

2025-07-28-18-29-33-08: 汉语 (Chinese):

2025-07-28-18-29-33-09: 文中分析了该电路依赖于忆阻器初始状态的动力学行为，并通过数值模拟和电路仿真揭示了与忆阻器初始状态相关的无数吸引子的共存现象。

2025-07-28-18-29-33-10: English:

2025-07-28-18-29-33-11: The dynamical behaviour just reflects the emergence of extreme multistability in the memristive circuit.

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2025-07-28-18-33-18-07: 汉语 (Chinese):
2025-07-28-18-33-18-08: 文献[2]报道，基于忆阻器的混沌电路的动力学稳定性与忆阻器的初始状态密切相关，这意味着忆阻电路中存在无限多个吸引子。
2025-07-28-18-33-18-09: English:
2025-07-28-18-33-18-10: In the coupled Rössler oscillator with partial synchronisation, the phenomenon depending on the initial state of a certain variable is called extreme multistability [3, 4].
2025-07-28-18-33-18-11: 汉语 (Chinese):
2025-07-28-18-33-18-12: 在具有部分同步的耦合Rössler振荡器中，这种依赖于某个变量初始状态的现象被称为极端多稳性[3, 4]。
2025-07-28-18-33-18-13: English:
2025-07-28-18-33-18-14: Thus, infinitely many attractors' behaviour closely relying on memristor initial state just reveals the emergence of extreme multistability in a memristive circuit.
2025-07-28-18-33-18-15: 汉语 (Chinese):
2025-07-28-18-33-18-16: 因此，无数吸引子的行为密切依赖于忆阻器初始状态这一特性，正揭示了忆阻电路中极端多稳性的涌现。

7/28/2025, 6:33:18 PM

2025-07-28-18-36-16-01: English:



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2025-07-28-18-42-17-02: Memristive circuit: Take a memristive Chua's circuit shown in Fig. 1a [6] as a paradigm.

2025-07-28-18-42-17-03: 汉语 (Chinese):

2025-07-28-18-42-17-04: 忆阻电路：以图 1a 所示的忆阻蔡氏电路[6]为范例。

2025-07-28-18-42-17-05: English:

2025-07-28-18-42-17-06: The flux-controlled memristor can be realised by discrete components, which is depicted in Fig. 1b [6].

2025-07-28-18-42-17-07: 汉语 (Chinese):

2025-07-28-18-42-17-08: 磁通控制的忆阻器可由分立元件实现，如图 1b 所示[6]。

2025-07-28-18-42-17-09: English:

2025-07-28-18-42-17-10: The voltage-current relation of the memristor can be expressed as $i_M = W(v_0)v_M = (-a + b|v_0|)v_M$ (1) where $a, b > 0$, and $W(v_0)$ is the memductance function.

2025-07-28-18-42-17-11: 汉语 (Chinese):

2025-07-28-18-42-17-12: 忆阻器的电压-电流关系可表示为 $i_M = W(v_0)v_M = (-a + b|v_0|)v_M$ (1)，其中 $a, b > 0$ ， $W(v_0)$ 是忆导函数。

2025-07-28-18-42-17-13: English:

2025-07-28-18-42-17-14: The flux $\phi_M(t)$ of the memristor is then given by $\phi_M(t) = \int_{t-\infty}^t v_M(\tau) d\tau = -R_0 C_0 v_0(t)$ (2)

2025-07-28-18-42-17-15: 汉语 (Chinese):

2025-07-28-18-42-17-16: 忆阻器的磁通量 $\phi_M(t)$ 则由 $\phi_M(t) = \int_{t-\infty}^t v_M(\tau) d\tau = -R_0 C_0 v_0(t)$ (2) 给出。

2025-07-28-18-42-17-17: English:

2025-07-28-18-42-17-18: Fig. 1 Memristive circuit for illustration of extreme multistability

2025-07-28-18-42-17-19: 汉语 (Chinese):

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[6] as a paradigm. The flux-controlled memristor can be realised by discrete components, which is depicted in Fig. 1b [6]. The voltage-current relation of the memristor can be expressed as

$$i_M = W(v_0)v_M = (-a + b|v_0|)v_M \tag{1}$$

where $a, b > 0$, and $W(v_0)$ is the memductance function. The flux $\varphi_M(t)$ of the memristor is then given by

$$\varphi_M(t) = \int_{-\infty}^t v_M(\tau) \, d\tau = -R_0 C_0 v_0(t) \tag{2}$$

7/28/2025, 6:42:46 PM

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$$L\frac{di_3}{dt} = v_2$$
$$C_0\frac{dv_0}{dt} = -v_1/R_0 \quad (3)$$

English:
According to Bao *et al.* [6], the linear element parameters are set to $R = 2 \text{ k}\Omega$, $C_1 = 6.8 \text{ nF}$, $C_2 = 68 \text{ nF}$, $L = 17.2 \text{ mH}$, $R_0 = 2 \text{ k}\Omega$, and $C_0 = 68 \text{ nF}$, and the non-linear element parameters are calculated as $a = 0.6667 \text{ mS}$ and $b = 0.403 \text{ mS/Wb}$.

汉语 (Chinese):
根据 Bao 等人[6]的文献，线性元件的参数设置为 $R = 2 \text{ k}\Omega$, $C_1 = 6.8 \text{ nF}$, $C_2 = 68 \text{ nF}$, $L = 17.2 \text{ mH}$, $R_0 = 2 \text{ k}\Omega$, $C_0 = 68 \text{ nF}$ ，而非线性元件的参数则计算为 $a = 0.6667 \text{ mS}$ 和 $b = 0.403 \text{ mS/Wb}$ 。

7/28/2025, 6:45:36 PM

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$$d_0 = \frac{1}{RLC_1C_2} + \frac{a + b|c|}{LC_1C_2}$$

By Routh–Hurwitz conditions, the roots of the cubic polynomial inside brackets of (5) have positive real parts when and only when

$$|c| < 0.4136 \text{ V and } 0.5005 \text{ V} < |c| < 1.3658 \text{ V} \tag{6}$$

For any c in the region of (6), the memristive circuit modelled by (3) is unstable, which implies that the circuit dynamics is mainly affected by the initial state $v_0(0)$, i.e. memristor initial state-dependent dynamics exists in the memristive circuit.

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- 2025-07-28-18-48-38-01: English:
- 2025-07-28-18-48-38-02: Memristor initial state-dependent dynamics: Obviously, model (3) has a line equilibrium, which can be expressed by
- 2025-07-28-18-48-38-03: 汉语 (Chinese):

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2025-07-28-18-48-38-19: $d_2 = 1/(RC_1) + 1/(RC_2) + (a + b|c|)/C_1$

2025-07-28-18-48-38-20: $d_1 = (a + b|c|)/(RC_1C_2) + 1/(LC_2)$

2025-07-28-18-48-38-21: $d_0 = 1/(RLC_1C_2) + (a + b|c|)/(LC_1C_2)$

2025-07-28-18-48-38-22: 汉语 (Chinese):

2025-07-28-18-48-38-23: $d_2 = 1/(RC_1) + 1/(RC_2) + (a + b|c|)/C_1$

2025-07-28-18-48-38-24: $d_1 = (a + b|c|)/(RC_1C_2) + 1/(LC_2)$

2025-07-28-18-48-38-25: $d_0 = 1/(RLC_1C_2) + (a + b|c|)/(LC_1C_2)$

2025-07-28-18-48-38-26: English:

2025-07-28-18-48-38-27: By Routh–Hurwitz conditions, the roots of the cubic polynomial inside brackets of (5) have positive real parts when and only when

2025-07-28-18-48-38-28: 汉语 (Chinese):

2025-07-28-18-48-38-29: 根据劳斯-赫尔维茨判据，式(5)中括号内的三次多项式的根具有正实部的充要条件是

2025-07-28-18-48-38-30: English:

2025-07-28-18-48-38-31: $|c| < 0.4136 \text{ V}$ and $0.5005 \text{ V} < |c| < 1.3658 \text{ V}$ (6)

2025-07-28-18-48-38-32: 汉语 (Chinese):

2025-07-28-18-48-38-33: $|c| < 0.4136 \text{ V}$ 且 $0.5005 \text{ V} < |c| < 1.3658 \text{ V}$ (6)

2025-07-28-18-48-38-34: English:

2025-07-28-18-48-38-35: For any c in the region of (6), the memristive circuit modelled by (3) is unstable, which implies that the circuit dynamics is mainly affected by the initial state $v_0(0)$, i.e. memristor initial state-dependent dynamics exists in the memristive circuit.

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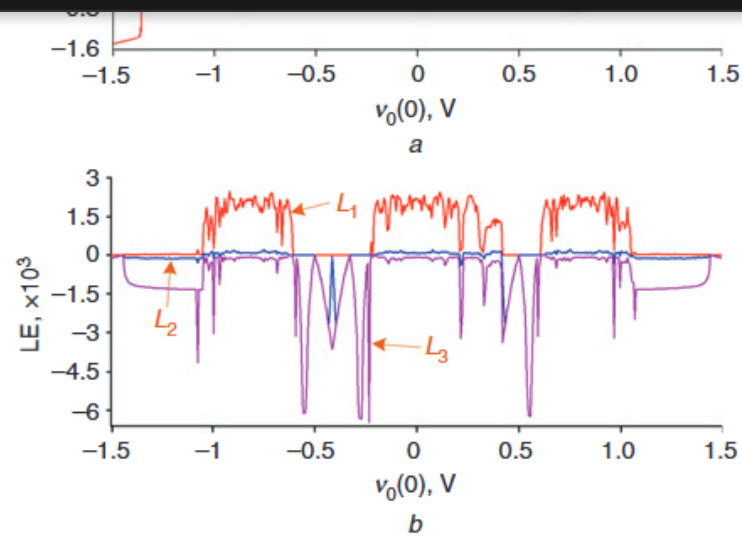


Fig. 2 Extreme multistability relying on memristor initial state $v_0(0)$

a Bifurcation diagram of $v_0(t)$

b Lyapunov exponent spectra

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2025-07-28-18-50-28-10: Fig. 2 Extreme multistability relying on memristor initial state $v_0(0)$

2025-07-28-18-50-28-11: 汉语 (Chinese):

2025-07-28-18-50-28-12: 图 2 依赖于忆阻器初始状态 $v_0(0)$ 的极端多稳性

2025-07-28-18-50-28-13: English:

2025-07-28-18-50-28-14: a Bifurcation diagram of $v_0(t)$

2025-07-28-18-50-28-15: 汉语 (Chinese):

2025-07-28-18-50-28-16: a $v_0(t)$ 的分岔图

2025-07-28-18-50-28-17: English:

2025-07-28-18-50-28-18: b Lyapunov exponent spectra

2025-07-28-18-50-28-19: 汉语 (Chinese):

2025-07-28-18-50-28-20: b 李雅普诺夫指数谱

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2025-07-28-18-53-18-01: English:

2025-07-28-18-53-18-02: Infinitely many attractors: With model (3) and circuit schematic in Fig. 1, infinitely many attractors in the memristive circuit can be captured by MATLAB numerical simulations and PSIM circuit simulations.

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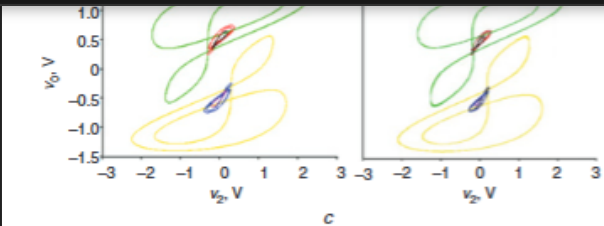


Fig. 3 Projections of infinitely many attractors on the v_2 - v_0 plane, where the lefts are MATLAB numerical simulations and the rights are PSIM circuit simulations

a $v_0(0) = 0$ V (orange), double-scroll chaotic attractor; $v_0(0) = 0.62$ V (red) and -0.21 V (magenta), upper and lower chaotic spiral attractors, respectively; $v_0(0) = -1.4$ V, -0.45 V, 0.45 V, 1.4 V (cyan), point attractors (marked with bold asterisks)
b $v_0(0) = 0.4$ V (blue) and 0.7 V (yellow), lower chaotic spiral attractors; $v_0(0) = 0.9$ V (green) and 1 V (red), upper chaotic spiral attractors
c $v_0(0) = -0.6$ V (blue) and -0.55 V (magenta), lower limit cycles; $v_0(0) = 0.33$ V (yellow), lower limit cycle; $v_0(0) = 0.6$ V (red) and 0.55 V (black), upper limit cycles; $v_0(0) = 0.995$ V (green), upper limit cycle

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翻译为汉语

Thoughts (experimental)

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Expand to view model thoughts

结论：在本快报中，我们重新研究了作为范例的忆阻蔡氏电路，并展示了其极端多稳性现象，该现象揭示了无数吸引子的共存。经PSIM电路仿真验证的结果表明，极端多稳性的涌现是由忆阻电路中依赖于忆阻器初始状态的动力学行为所引发的。考虑到为忆阻器初始状态赋上不同期望值的困难，在硬件实验中很难捕捉到无数吸引子所呈现的显著动力学行为。解决这一问题可能成为未来研究的课题。

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